**We Claim:**

1.    A method for correcting room acoustics at multiple-listener positions, the method comprising:

measuring a room acoustical response at each listener position in a multiple-listener environment;

warping each of the room acoustical response measured at said each listener position;

determining a general response by computing a weighted average of the warped room acoustical responses;

generating a low order spectral model of the general response;

obtaining a warped acoustic correction filter from the low order spectral model; and

unwarping the warped acoustic correction filter to obtain a room acoustic correction filter;

wherein the room acoustic correction filter corrects the room acoustics at the multiple-listener positions.

2.    The method according to claim 1, further including the step of generating a stimulus signal for measuring the room acoustical response at each of the listener positions.

Rule 1.126    3. 8.    The method according to claim 1, wherein the general response is determined by a pattern recognition method.

31

*Rule 1.126*

4 8. The method according to claim 5, wherein the pattern recognition method is at least one of a hard c-means clustering method, a fuzzy c-means clustering method, or an adaptive learning method.

5 8. The method according to claim 1, wherein the warping is achieved by means of a bilinear conformal map.

6 9. The method according to claim 1, wherein the spectral model includes a t least one of a Linear Predictive Coding (LPC) model or a pole-zero model.

7 11. The method according to claim 1, wherein the warped acoustic correction filter is the inverse of the low order spectral model.

8 12. A method for generating substantially distortion-free audio at multiple-listeners in an environment, the method comprising:

measuring acoustical characteristics of the environment at each expected listener position in the multiple-listener environment;

warping each of the acoustical characteristics measured at said each expected listener position;

generating a low order spectral model of each of the warped acoustical characteristics;

obtaining a warped acoustic correction filter from the low order spectral model;

unwarping the warped acoustic correction filter to obtain a room acoustic correction filter;

filtering an audio signal with the room acoustical correction filter; and

transmitting the filtered audio from at least one loudspeaker, wherein the audio signal received at said each expected listener position is substantially free of distortions.

13. The method according to claim 12, further including the step of determining a general response by a pattern recognition method.

14. The method according to claim 13, wherein the pattern recognition method is at least one of a hard c-means clustering method, a fuzzy c-means clustering method, or an adaptive learning method.

15. The method according to claim 12, wherein the warping is achieved by a bilinear conformal map.

16. The method according to claim 12, wherein the spectral model includes at least one of a Linear Predictive Coding (LPC) model or a frequency weighted pole-zero model.

17. The method according to claim 12, wherein the warped acoustic correction filter is the inverse of the general response.

18. A system for generating substantially distortion-free audio at multiple-listeners in an environment, the system comprising:

a filtering means for performing multiple-listener room acoustic correction, the filtering means formed from:

33

(i) warped room acoustical responses, wherein the room acoustical responses are measured at each of an expected listener position in a multiple-listener environment;

(ii) a weighted average response of the warped room acoustical responses;

(iii) a low order spectral model of the weighted average response;

(iv) a warped filter formed from the low order spectral model; and

(v) an unwarped room acoustic correction filter obtained by unwarping the warped filter;

wherein an audio signal, filtered by the filtering means comprised of the room acoustic correction filter, is received substantially distortion-free at each of the expected listener positions.

15. ~~19.~~ The system according to claim 18, wherein the weighted average response is determined by a pattern recognition means.

16. ~~20.~~ The system according to claim 19, wherein the pattern recognition means is at least one of a hard c-means clustering system, a fuzzy c-means clustering system, or an adaptive learning system.

17. ~~21.~~ The system according to claim 18, wherein the warping is achieved by an all-pass filter chain.

34

22. The system according to claim 18, wherein the warped filter includes an inverse of the lower order spectral model.

23. The system according to claim 18, wherein the spectral model includes at least one of a Linear Predictive Coding (LPC) model or a frequency weighted pole-zero model.

24. A method for correcting room acoustics at multiple-listener positions, the method comprising:

warping each room acoustical response, said each room acoustical response obtained at each expected listener position;

clustering each of the warped room acoustical response into at least one cluster, wherein each cluster includes a centroid;

forming a general response from the at least one centroid;

inverting the general response to obtain an inverse response;

obtaining a lower order spectral model of the inverse response;

unwarping the lower order spectral model of the inverse response to form the room acoustic correction filter;

wherein the room acoustic correction filter corrects the room acoustics at the multiple-listener positions.

25. The method according to claim 24, wherein the warping is achieved by a bilinear conformal map.

26. The system according to claim 24, wherein the spectral model includes a frequency weighted pole-zero model.